

IN THE CLAIMS

Claim 1. (Currently amended) A method for validating a rear steering angle of a vehicle, comprising:

receiving a plurality of signals indicative of said rear steering angle;
checking at least one of said plurality of signals to determine if it falls within a valid range;

correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is invalid; and

signaling a rejection of any of said plurality of signals found to be invalid.

Claim 2. (Currently Amended) A method for validating a rear steering angle of a vehicle, comprising:

receiving a plurality of signals indicative of said rear steering angle;
checking at least one of said plurality of signals to determine if it falls within a valid range;

correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is invalid;

signaling a rejection of any of said plurality of signals found to be invalid;

A method as defined in Claim 1, wherein said correlating comprising: includes comparing said first signal with an expected value at about an inflection point of said second signal.

Claim 3. (Original) A method as defined in Claim 2, said correlating further comprising:

adding a second rear-wheel angle offset corresponding to said inflection point to a signal corresponding to said second signal in response to said comparing.

Claim 4. (Original) A method as defined in Claim 3, said correlating further comprising:

subtracting a center value from said second signal; and
multiplying a result of said subtracting by a scale factor.

Claim 5. (Original) A method as defined in Claim 3, further comprising:
computing said expected value with reference to a look-up table.

Claim 6. (Original) A method as defined in Claim 3, further comprising:
computing said expected value by evaluating a continuous function.

Claim 7. (Original) A method as defined in Claim 1, said correlating comprising:
calculating a steering angle corresponding to one of said first signal and said
second signal so as to create a calculated angle; and
computing an expected value of the other of said first signal and said second
signal in accordance with said calculated angle.

Claim 8. (Original) A method as defined in Claim 7, said correlating further
comprising:

comparing said expected value of said other of said first signal and said
second signal with an actual value of said other of said first signal and said second signal.

Claim 9. (Original) A method as defined in Claim 8, said correlating further
comprising:

determining that any of said plurality of signals is invalid if said expected
value and said actual value are not substantially equivalent.

Claim 10. (Original) A method as defined in Claim 7, wherein at least one of said
calculating and said computing further comprises using a look-up table.

Claim 11. (Original) A method as defined in Claim 7, wherein at least one of said
calculating and said computing further comprises evaluating a continuous function.

Claim 12. (Original) A method as defined in Claim 1, wherein said plurality of
signals comprises a plurality of signal components of a single carrier signal.

Claim 13. (Original) A method as defined in Claim 1, wherein said receiving further
comprises providing a single sensor having two signal outputs.

Claim 14. (Original) A method as defined in Claim 1, wherein said checking further comprises:

comparing at least one of said plurality of signals with an upper limit; and
comparing at least one of said plurality of signals with a lower limit.

Claim 15. (Currently amended) A storage medium encoded with a machine readable computer program code comprising:

computer code for receiving a plurality of signals indicative of a rear steering angle;

computer code for checking at least one of said plurality of signals to determine if it falls outside a valid range and is invalid;

computer code for correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is are invalid; and

computer code for signaling a rejection of any of said plurality of signals found to be invalid.

Claim 16. (Currently amended) A computer data signal comprising:

computer code for receiving a plurality of signals indicative of a rear steering angle;

computer code for checking at least one of said plurality of signals to determine if it falls outside a valid range and is invalid;

computer code for correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is are invalid; and

computer code for signaling a rejection of any of said plurality of signals found to be invalid.

Claim 17. (Currently amended) A rear steering system for a vehicle, comprising:
at least one actuator in operable communication with a pair of rear wheels; and
a controller operably interconnected with said actuator; a
means for receiving a plurality of signals indicative of a rear steering angle of
said rear wheels;
means for checking at least one of said plurality of signals to determine if it
falls outside a valid range and is invalid;
means for correlating at least a first signal of said plurality of signals with at
least a second signal of said plurality of signals to determine if either said first signal or said
second signal is arc invalid; and
means for signaling a rejection of any of said plurality of signals found to be
invalid.

Claim 18. (Currently amended) A controller for a rear-wheel steering system,
the controller comprising:
means for receiving a plurality of signals indicative of a rear steering angle;
means for checking at least one of said plurality of signals to determine if it
falls outside a valid range and is invalid;
means for correlating at least a first signal of said plurality of signals with at
least a second signal of said plurality of signals to determine if either said first signal or said
second signal is arc invalid; and
means for signaling a rejection of any of said plurality of signals found to be
invalid.

Claim 19. (Currently amended) A controller for a rear-wheel steering system, the controller comprising:

at least one input terminal for receiving a plurality of signals indicative of a rear steering angle;

at least one comparator for checking at least one of said plurality of signals to determine if it falls outside a valid range and is invalid;

at least one correlation function for correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is are invalid; and

at least one output terminal for signaling a rejection of any of said plurality of signals found to be invalid.

Claim 20. (Currently amended) A method for determining a steering angle comprising:

receiving a plurality of signals indicative of said steering angle;

checking at least one of said plurality of signals to determine if it falls within a valid range;

correlating at least a first signal of said plurality of signals with at least a second signal of said plurality of signals to determine that neither said first signal or said second signal is are invalid;

determining a first value of said steering angle in accordance with said first signal; and

determining a second value of said steering angle in accordance with said first value of said steering angle and said second signal in order to obtain a more accurate measurement.

DETAILED ACTION**Claim Disposition**

Claims 1 - 20 are pending in the application. Claims 1 and 7 – 20 have been rejected. Claims 2 – 6 have been indicated as being allowable if rewritten in independent form.

Claim Objections

Claim 1 stands objected to because of informalities: In particular, the Examiner has noted that “on the second to last line after “signals” --are-- should be entered.” “Appropriate correction is required.” Applicants appreciate the Examiner’s observations regarding Claim 1 and have amended Claims 1 and 15 – 20 to correct the terminology to address the Examiner’s concerns.

Allowable Subject Matter

Claims 2-6 have been objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Examiner states:

“The prior art of record does not disclose comparing said first signal with an expected value at about an inflection point of said second signal.”

Applicants appreciate the Examiner’s indication of the allowability of Claims 2 – 6. Claim 2 has been rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 2 – 6 should now be allowable.

Claim Rejections - 35 USC §103

Claims 1, and 7-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoshi et al., U.S. Patent Application 2001/0004720 A1, hereinafter referred to as Hoshi, in view of Eguchi, U.S. Patent No. 5,554,969, hereinafter referred to as Eguchi. Applicants respectfully traverse. The Examiner states in the Office Action:

"As per claims 1,15,16,17,18, 19, and 20, Hoshi et al. disclose receiving a plurality of signals indicative of the rear steering angle in paragraph 20; checking at least one of said plurality of signals to determine if it falls within a valid range in paragraph 20; correlating at least a first signal of the plurality of signals with at least a second signal of said plurality of signals to determine if either said first signal or said second signal is invalid in paragraph 20. Hoshi et al. do not disclose signaling a rejection of any of said plurality of signals is found to be invalid. Eguchi teaches signaling a rejection of any of said plurality of signals is found to be invalid on lines 38-42, on column 2. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the warning means of Eguchi in the invention of Hoshi et al. because such modification would alert the driver to have the system fixed."

"As per claim 11, Hoshi et al. disclose computing said expected value by evaluating a continuous function in Figure 6A. The expected values are found from previous signals that are stored."

"As per claim 7, Hoshi et al. disclose calculating a steering angle corresponding to one of said first signal and second signal so as to create a calculated angle in paragraph 22; and computing an expected value of the other of said first signal and said second signal in accordance with said calculated angle in paragraph 22."

"As per claim 8, Hoshi et al. disclose comparing said expected value of said other of said first signal and said second signal in paragraph 52."

"As per claim 9, Hoshi et al. disclose determining than any of said plurality of signals is invalid if said expected value and said actual value are not substantially equivalent in paragraph 52."

"As per claim 10, Hoshi et al. disclose wherein at least one of said calculating and said computing further comprises using a look-up table in paragraph 56."

"As per claims 12 and 13, Hoshi et al. disclose said plurality of signals comprises a plurality of signal components of a single carrier signal in paragraph 10; providing a single sensor having two signal outputs in paragraph 10."

"As per claim 14, Hoshi et al. disclose comparing at least one of said plurality of signals with an upper limit and a lower limit in paragraph 56."

Applicants respectfully contend that explanation in the Office Action mischaracterizes the teachings of Hoshi and/or Eguchi and that the cited references do not teach or disclose each element of the invention. For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, U.S.P.Q.2d

1596, 1598 (Fed. Cir. 1988). The Examiner must meet the burden of establishing that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

With regard to Claims 1 and 15 - 20, Applicants respectfully maintain that the Examiner has used an improper standard in arriving at the rejection of the above claims under §103, based on improper hindsight which fails to consider the totality of Applicant's invention and the totality of the cited references. More specifically the Examiner has used Applicants' disclosure to select portions of the cited references to allegedly arrive at Applicants' invention. In doing so, the Examiner has failed to consider the teachings of the references or Applicants' invention as a whole in contravention of §103.

In particular, the Examiner has provided no explanation or suggestion for the motivation to make the suggested combination, nor has the Examiner identified where in the cited references or the art teaching of such motivation may be found. *In re Fine* specifically requires that the Examiner must meet the burden of establishing the suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references. The explanation in the Office Action provides no such suggestion or incentive other than the assertion that it would have been obvious to do so. There is no specific teaching in Hoshi that would motivate one skilled in the art to look to Eguchi for the purposes suggested by the Examiner. In fact, Eguchi teaches away from the suggested combination as Eguchi is specifically drawn to detecting a failure of a single sensor, while Hoshi is specifically drawn to a rotational angle detecting device employing a plurality of detection signals. Evidently, the Examiner has employed improper hindsight to merely locate references enumerating similar elements to those claimed without providing suggestion for their combination. In fact, that is precisely what has transpired. The Examiner, based on the previous Office Action Response acknowledged that Hoshi could not anticipate Applicants' claims, and has merely located another reference that appears to include the missing element. This is precisely the course of action prohibited by the teaching of *In re Fine*. Therefore, the

Examiner has not made a *prima facie* case for obviousness and Claims 1 and 15 - 20 may not be rendered unpatentable as suggested. Therefore, Claims 1 and 15 - 20 are allowable, the rejections are improper, and they should be withdrawn.

With regard to Claim 7, Applicants respectfully contend that neither Hoshi nor Eguchi teach or disclose each element of the invention. Specifically, Hoshi '720 does not teach or disclose, "calculating a steering angle corresponding to one of said first signal and said second signal so as to create a calculated angle." To support the rejection of this element, the explanation in the Office Action relies on paragraph 22 of Hoshi. However, at paragraph 22 there is no disclosure with respect to calculating a steering angle corresponding to *one of said first signal and said second signal*. In fact, paragraph 22 discloses how the first and second detection signals are compared and then how they are compared with the third detection signal. There is no teaching what so ever regarding calculating a steering angle in paragraph 22 of Hoshi as cited.

Moreover, Hoshi does not teach or disclose, "computing an expected value of *the other of* said first signal and said second signal in accordance with said calculated angle." Hoshi does not teach or disclose anything with respect to using one signal to make one determination e.g., calculated angle" and using the other signal for another, e.g., "expected value". In fact, paragraph 22 merely teaches how the signals are utilized for the comparison in Hoshi.

Finally, employing the Examiner's prior suggested interpretation of the Applicants' claims would result in a mischaracterization of the claims. Specifically, the Examiner stated in the first Office Action: "if the reference is interpreted so that the first signal in the claim is either the first or second signal in the reference and the second signal in the claim is the third signal in the reference then the reference reads on the invention." Applying the Examiner's suggested interpretation to the claim elements results in using one of the first or second detection signals of Hoshi as the Applicants' claimed "first signal" and the third detection signal of Hoshi as the Applicants' claimed "second signal." Applied to the language of the claim, this approach would suggest: forming the calculated steering angle from the AC first and second detection signals of Hoshi, and then computing an expected value of the *third* detection signal of Hoshi in accordance with said calculated angle. However, this interpretation is in contravention of the teachings of Hoshi et al., wherein it is disclosed that the third detection signal is compared to both the first detection signal and the second detection signal. (See para. 22 and 64 - 66), and the comparison is of the first two detection

signals (a), (b), with the third (c) to see if they (a, b, emphasis added) fall within their proper ranges. Therefore, because Hoshi does not disclose or teach an element of the invention it cannot anticipate the Applicants' claims. Thus, Claim 7 is allowable, the rejections are improper, and they should be withdrawn.

In view of the above discussion, Claims 8 – 11 depend from Claim 7, whether directly or indirectly, and include all of the corresponding limitations thereof. Claim 7 is not taught by Hoshi, therefore, Claims 8 – 11 cannot be taught by Hoshi either. Thus, Claims 8 – 11 are allowable, the rejections are improper and they should be withdrawn.

The arguments and amendments presented herein are made for the purposes of better defining the invention, rather than to overcome the rejections for patentability. The claims have not been amended to overcome the prior art and therefore, no presumption should attach that either the claims have been narrowed over those earlier presented, or that subject matter or equivalents thereof to which the Applicants are entitled has been surrendered. Allowance of the claims is respectfully requested in view of the above remarks. Moreover, no amendments as presented alter the scope of the claimed invention and therefore cannot necessitate a new grounds rejection.

It is believed that the foregoing remarks are fully responsive to the Office Action and that the claims herein should be allowable to the Applicants. In the event the Examiner has any questions or concerns regarding the instantly submitted response, the undersigned respectfully request the courtesy of a telephone conference to discuss any matters in need of attention.

If there are additional charges with respect to this matter or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully Submitted,

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